(19) World Intellectual Property Organization

International Bureau



(43) International Publication Date 31 March 2005 (31.03.2005)

PCT

(10) International Publication Number WO 2005/029868 A1

- (51) International Patent Classification⁷: H04N 7/26, 7/50
- (21) International Application Number:

PCT/IB2004/051811

(22) International Filing Date:

21 September 2004 (21.09.2004)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

60/505,221

23 September 2003 (23.09.2003)

- (71) Applicant (for all designated States except US): KONIN-KLIJKE PHILIPS ELECTRONICS, N.V. [NL/NL]; Groenewoudseweg 1, NL-5621 BA Eindhoven (NL).
- (72) Inventor; and
- (75) Inventor/Applicant (for US only): YE, Jong Chul [KR/US]; P.O. Box 3001, Briarcliff Manor, New York 10510-8001 (US).
- (74) Common Representative: KONINKLIJKE PHILIPS ELECTRONICS, N.V.; c/o Gathman, Laurie, P.O. Box 3001, Briarcliff Manor, New York 10510-8001 (US).

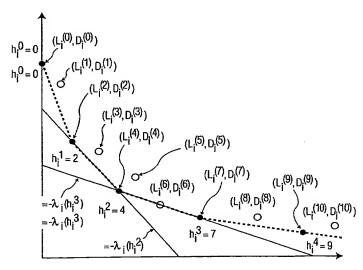
- (81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.
- (84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Declarations under Rule 4.17:

as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii)) for the following designations AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE,

[Continued on next page]

(54) Title: RATE-DISTORTION VIDEO DATA PARTITIONING USING CONVEX HULL SEARCH



(57) Abstract: Method for partitioning video data into a base layer and at least one enhancement layer entailing receiving video data, determining DCT coefficients for a plurality of blocks of a video frame to form the base layer and the at least one enhancement layer and for each block, quantizing the DCT coefficients, converting the quantized DCT coefficients of the base layer into a set of (run, length) pairs, and determining which pairs lie on a convex hull. Thereafter rate -distortion optimal partitioning points are determined from only those pairs which lie on the convex hull in a causally optimal way. The (run, length) pairs before and inclusive of the partitioning point are encoded in the base layer while the other (run, length) pairs are encoded in the enhancement layer(s). A video encoder (22) and decoder (28) applying the method are also disclosed.



WO 2005/029868 A1

EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW, ARIPO patent (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE,

- IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG)
- as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii)) for all designations

Published:

with international search report

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.